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Impact of Sustainability Features on Time on Market of Commercial Rental Property in Lagos, Nigeria

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Abstract

This research analysed how sustainability features impacted the time-on-market of commercial rental properties in Lagos, Nigeria. A quantitative research design was utilised in the study, where 250 registered estate surveying and valuation firms were sampled to administer the structured questionnaires, of which 150 valid responses were collected and analysed. The research examined how the sustainability qualities, such as energy efficiency, water conservation, indoor environmental quality, and accessibility, impacted the leasing performance. Factor analysis was used to derive the latent dimensions of sustainability, and independent samples t-tests were used to establish significant variations in the TOM between properties that had and those that did not have sustainable features. The findings show that commercial properties with sustainability elements are rented much quicker than non-sustainable ones, which proves the existence of a tangible market benefit of a green attribute. These results support the argument that sustainability is neither an environmental nor an ethical concern but rather a performance determinant of market liquidity and an investment return. The study argued that developers, investors and policymakers should mainstream sustainability ideals in property development and urban governance to improve commercial efficiencies of the market, shorten vacancy cycles, and promote environmentally friendly growth in the emerging real estate markets.

Keywords: *Sustainability Features, Green Buildings, Time-on-Market, Commercial Rental Property, Nigeria, Quantitative*

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1. Introduction

Sustainability can be defined as development that can fulfil the needs of the current generation without jeopardizing the capacity of the future generation to satisfy their needs, and ensuring the balance between economic growth and development, environmental management, and societal well-being (WCED, 1987; Dasgupta, 2021; Richardson et al., 2023). The idea is still a multi-dimensional and controversial one, yet in its most generalised form, it promotes a trade-off between resource economy, environmental conservation and social equity. In the built environment, sustainable construction has become a viable implementation of this philosophy and has been defined as the process of planning, designing, constructing and operating buildings with environmental integrity, social equity and economic viability in their entire life cycles (El Hafiane et al., 2025).

Commercial real estate includes the property that is dedicated mainly to business activities (offices, shopping malls, and industrial plants), whose worth is based on the income by way of rent or appreciation of value (Geltner et al., 2025). Incorporation of sustainability into Commercial real estate is gaining acceptance as a channel to achieving resilience in the performance of assets, efficiency of resources and competitive performance in the market over the long-term. A balance between sustainability and commercial real estate is therefore connected in the form of a shorter term of lease, low vacancy rates, increased rental premiums, and the satisfaction of tenants (Hu, Kok & Palacios, 2023; JLL, 2024).

Sustainability features have taken centre stage in building innovation in the world today. Al-Jannabi et al. (2014) and Kamaruddin et al. (2020) identified such aspects as energy-efficient construction, harvesting of rainwater, recyclable and locally produced materials, green roofs, and intelligent lighting and ventilation systems as important characteristics of the sustainable building. The features enhance environmental protection, reduce operational costs, and enhance comfort among the occupants. The experience of advanced economies shows that green buildings with environmental friendliness and certification are faster in attraction, generate greater occupancy rates, and are less likely to spend time on the market (Eichholtz, Kok and Yonder, 2024; Liu et al., 2025). Nevertheless, the use of sustainable construction practices is still in its early stages in the emerging economies because of the institutional weaknesses, financing needs, and policy incentives.

In Nigeria, sustainability in the real estate sector is a growing subject matter of discussion, but there is still little action taken, and implementation is still fragmented. The cost of electricity, poor infrastructure, and lack of implementing mechanisms of control have limited the prevalence of sustainable building elements (Chinomona et al., 2024; Ankeli et al., 2025). It is quite common that commercial property developers and the owners of commercial properties are faced with the necessity of having to incorporate energy-saving systems and on-site renewables not due to environmental awareness, but due to survival reasons in the face of uncertain grid power and soaring diesel prices (Ekung, Odesola and Adewuyi, 2022; UNEP, 2023). These working realities have made sustainability practices the economic prerequisites and not the decorations.

Lagos, being the business hub of Nigeria, generates a greater proportion of about 30 percent of the national GDP and is the largest city economy in Africa (African Development Bank Group, 2024),

and offers a very attractive case study to research the topic of sustainability in Commercial Real Estate. The city is home to more than 60 percent of the headquarters of the major businesses and is still experiencing a flood of new developments with green technologies and smart infrastructure. However, even with this increasing realisation, there is still a paucity of empirical data regarding the impact of the sustainability features on time-on-market (TOM), the time that a building lies vacant until it is successfully leased to tenants, of commercial rental buildings in Lagos.

The determinants of TOM in the past have been studied mostly in terms of property characteristics, including location, clarity of the title, and asset type via previous Nigerian studies (Olaleye, Ekemode and Olapade, 2015; Bello, 2015; Sani and Gbadegesin, 2015; Adegoke and Fadeyi, 2022). Nevertheless, not many have directly assessed the impact of sustainability attributes like energy efficiency, incorporation of renewable energy, and indoor environmental quality on TOM results. This means that developers, investors, and valuers may not be able to provide empirical indicators as to whether green features offer competitive leasing benefits or have any impact on vacancy period. The evidence deficiency is a significant knowledge gap (theoretical and practical), bearing in mind that long vacancies erode income streams, raise the holding costs and reduce the returns on the investments by real estate stakeholders.

The study discusses how the sustainability features affect the time-on-market of commercial renting properties in the city of Lagos in Nigeria. Specifically, it seeks to:

i. Determine some of the major sustainability features in commercial real estate constructions in Lagos.
ii. Compare the time-on-market of commercially rented properties that had sustainability features and those without.
iii. Identify the sustainability attributes that can highly affect the speed of leasing in the Lagos commercial real estate.

This research is significant in view of the growing national and international focus on sustainable urban development and energy-efficient infrastructure. Although sustainability has become the focus of the international construction discourse, the empirical data on it is limited, especially in the context of determining the implications of sustainability for the market. This paper is therefore a response to the policy impetus behind sustainable cities (**SDG 11**) and a contribution to the efforts by Nigeria to adhere to the low-carbon development strategies. The importance of the research is that it may offer practical information to various stakeholders. To developers and investors, it elucidates the sustainability integration as a way of improving marketability and occupancy performance. It gives an empirical underpinning to the issue of sustainability in valuation and marketing strategies to the estate surveyor and valuers. This study provides evidence to the urban policymakers and regulators to inform incentives and regulations that can accelerate the transformation of Nigeria into sustainable commercial property markets.

The rest of this article is organised in the following way: Section 2 provides a review of the literature on the relevance of sustainability and real estate markets, with a particular focus on the nexus of time-on-market and sustainable construction. Section 3 describes the research methodology, such as data collection and data analysis methods. Empirical results are given and discussed in Section 4, and policy implications and recommendations are given at the end of Section 5.

2. Literature Review

2.1. Conceptual Foundations

Sustainability has assumed a central place in the modern development discourse, with the priority being the need to ensure the fulfilment of the current needs of society without affecting the ability of future generations to satisfy their own needs. It was initially proposed by the World Commission on Environment and Development (WCED, 1987) and then further developed to include three mutually supportive dimensions, i.e., economic growth, environmental protection, and social equity (Dasgupta, 2021; Richardson et al., 2023). The following dimensions, also known as the Triple Bottom Line (TBL), are a keystone and basis of assessing the achievement of sustainable development.

Sustainability in the commercial real estate context implies the development of built environments that are economic, environmentally sustainable, and socially inclusive. A combination of these dimensions allows developers and other stakeholders to produce properties that not only meet the current market demands but are also able to withstand, be fair and competitive as time goes by. This holistic strategy is especially relevant in such a developing economy like Nigeria, where the process of urbanisation, lack of infrastructure, and high levels of socioeconomic inequality complicate the task of attaining sustainable growth.

Sustainable construction is an embodiment of sustainability principles in the built environment. It includes the total building lifecycle, including planning and design, construction, operation, maintenance, renovation, and eventual demolition, implemented in a manner that ensures efficient use of resources, being a good steward of the environment, and being socially equitable (El Hafiane et al., 2025; Timm et al., 2023; Wang et al., 2022). Kumar, Sharma and Sharma (2024) indicated that sustainable construction implies that the built environments should be functional within ecological limits and be proactive in alleviating social and environmental injustices.

Sustainable features across the commercial real estate sector are generally those that incorporate energy-efficient systems, water-saving technologies, site management practices that are responsible and observance of green certification systems. Such qualities not only decrease the environmental footprints but also provide direct economic benefits, including reduced operational expenses, higher asset values, and better positions on market positions (UNEP, 2023; Chinomona et al., 2024).

Time-on-Market (TOM) is one of the key performance indicators in the context of the real estate industry that quantifies the time of the property on the market before its sale or lease (Liu et al., 2024). TOM can be used as an indicator of market liquidity and efficiency: shorter terms can be associated with high demand, correct pricing, and healthy market dynamics, whereas longer TOM can be associated with overvaluation, poor demand, or structural defects (Adegoke and Fadeyi, 2022). TOM plays a significant role in the assessment of sustainability features within commercial real estate in the context of sustainability. Green certified properties or environmentally conscious elements of design are often rented at a premium, more often filled, and leased up faster. According

to the findings of global and regional studies, financial returns in sustainably designed buildings are correlated with tenant satisfaction and general performance of the building (Hu, Kok & Palacios, 2023). To illustrate, in Europe, certified green office buildings have been shown to have operating income and transaction price premiums of about 1012 per cent relative to their non-certified counterparts (Ghosh and Petrova, 2023).

Nevertheless, the empirical evidence in Nigeria is limited, especially in relation to investment in rental markets in Lagos. This research, therefore, adds to the growing literature base by offering new knowledge on the operation and market of sustainable commercial real estate in Nigeria.

2.2. Dimensions of Sustainability in Commercial Real Estate

Sustainable commercial real estate is based on three mutually reinforcing pillars, which include economic, environmental, and social sustainability (Kibert, 2022; Kumar et al., 2024). These dimensions are required to work together to achieve long term value creation and resilience. Economic sustainability focuses on the life cycle cost effectiveness and optimisation of asset value and high operational performance. Evidence also indicates that certified sustainable buildings have certain financial benefits: Western European buildings record 1012% higher operation income and selling price (Ghosh and Petrova, 2023), and ESG-certified properties have a rent premium of 25%. Property owners in Nigeria are gradually replacing conventional and energy-intensive characteristics with smart and environmentally-friendly ones to charge a premium lease fee (Alohan et al., 2023; Ejidike and Mewomo, 2023). Nevertheless, majority of local research is still descriptive and small-scale and there is a gap in methodology in quantifying the impact of sustainability features on financial performance and time-on-market.

Environmental sustainability involves reduction of ecological footprints in terms of energy, water and carbon efficiency. Climate risks and the inefficient use of energy have a negative impact on the asset value all over the world, and the average rental premium of green-certified buildings is 5.464 (CBRE, 2023; Clayton et al., 2021). Frequent flooding in Nigeria, deficient waste management and unreliable power supply have increased the demand to adopt solar and water-saving systems. However, there is little systematic measurement of environmental performance, e.g., actual energy use or embodied carbon, and little empirical evaluation of their effect on TOM.

Social sustainability relates to health, equity, and the well-being of the occupants. On the international scale, WELL-certified and other similar buildings are associated with increased tenant satisfaction, better health results, and extended lease (Singh, 2010; Allen et al., 2016; Ildiri et al., 2022; Kent, Parkinson and Schiavon, 2024). The growing demand of indoor air quality, natural lighting, and thermal comfort is an indicator of increased health awareness in Lagos. However, commercial green buildings are mostly targeted at users that are high-income earners and inclusivity and affordable nature is not majorly considered in sustainability evaluation.

2.3. Commercial Real Estate Sustainability Features and Time-on-Market

Time-on-Market, the time interval between the listing of a property and the leasing or sale of the property, is affected by various factors (location, price, condition of the property). It gives an understanding of efficiency in the market and the responsiveness of demand. Sustainable

commercial property TOM is a significant measure of the sustainability features that market values. Global empirical research indicates that lease-up and occupancy performance are linked to green certifications and sustainability characteristics. For instance, a European study by Ghosh and Petrova (2023) determines that certified buildings have greater operating income and sell quickly. According to Al-Haimi et al. (2025), 2-5% rent premiums are associated with ESG-certified buildings, which in some cases of the market may suggest rapid demand absorption (that is, low TOM). In Japan, the premiums of rent charged on green certified properties in office markets compared to noncertified properties are around 5.4-6.4 percent, which is associated with the increased demand (CBRE, 2023). Moreover, a property is less likely to experience vacancy growth and experience poor financial performance in situations when the level of tenant satisfaction is high (usually relating to sustainable features and proper property management) (Hu and Palacios, 2023).

In Nigeria, tenants who are entrepreneurs in Lagos are finding properties that have smart/green qualities more attractive, and this enables property owners to charge them higher rents (Alohan et al, 2023; Ejidike and Mewomo, 2023; Olaniran, Morales and Harris, 2025). Nonetheless, there is little or no academic empirical research directly quantifying the impact of sustainability features on TOM on commercial rental properties in Lagos. The majority of the research (such as Adegoke and Fadeyi, 2022) considers TOM as the relationship with traditional property attributes (title, location, condition, finishing) but leaves sustainability variables out. There is technically no peer-reviewed research that includes a full-fledged set of sustainability features with econometric modelling of TOM in Lagos. Moreover, in other markets, sustainability characteristics can decrease TOM, though at other times, an increase in rents can push away some tenants, which can increase TOM. How these trade-offs are being exercised in Nigeria has no consensus model. Thus, the gap in strong empirical research to measure the impacts of sustainability characteristics on the time-on-market of commercial rented buildings in Lagos, Nigeria, particularly the application of modern modelling, as well as the recent information, is critical. The absence of this evidence makes the assertions concerning the market value of the sustainability features tentative, and policy-based suggestions can have an insufficient empirical basis.

3. Methods

3.1 Research Design and Approach

The research design used was a quantitative, cross-sectional survey design, which was appropriate to empirically test quantifiable rapport involving sustainability characteristics and the length of tenure in the business rental premises (time on market). This design allows studying objective and measurable data obtained from the professional respondents working within a geographic location, which is Lagos Island, one of the central submarkets in Lagos State, Nigeria. The methodology of the research was based on the positivist epistemology, which presupposes the possibility of objective observation of real-world phenomena like the sustainability-based market performance and its statistically justifiable validation. By implication, this research used factor analysis to determine the latent constructs behind the sustainability characteristics and independent samples t-tests to prove the hypothesis of the mean difference in TOM between the sustainable and non-sustainable properties.

3.2 Population and Sampling Procedure

The study population involved all the estate surveying and valuation firms that were registered by the Nigerian Institution of Estate Surveyors and Valuers (NIESV) in Lagos State Chapter and the Estate Surveyors and Valuers Registration Board of Nigeria (ESVARBON). The 2024 NIESV Directory shows that there are 250 registered and active firms in Lagos Island. Because the population size is manageable, a total enumeration sampling method was adopted to guarantee that all the data is covered and to eliminate the effects of sampling bias. A total of one senior estate surveyor and valuer was selected purposely as respondents of each firm, usually a principal partner or managing surveyor, as such a person is directly involved in transactions and decision making in the market. Of the 250 questionnaires issued, 150 valid responses were retrieved, and this is a response rate of 60%, which is well above the 50% mark, which is considered to be a good representation in social science and real estate market studies.

3.3 Instrumentation and Data Collection Procedures

The designed questionnaire is structured according to an in-depth analysis of the previous research on the sustainable real estate and market dynamics (Eichholtz et al., 2010; Younos and Parece, 2016; Maqbool et al., 2023). The tool consisted of three significant parts:

1) Background section A – Generalised demographic and professional details about the respondents were obtained (academic qualification, professional status, years of experience and service scope).
2) Section B – Sustainability Features asked the required respondents to specify the perceived importance and prevalence rates of the identified sustainability features within the commercial premises in their control on a five-point Likert scale (1 = Not Important, 5 = Extremely Important).
3) Section C – Market Performance Metrics acquired quantified estimates of time-on-market (TOM) (in days) of sustainable and non-sustainable commercial rental properties.

To test relevance, clarity and construct validity, the questionnaire underwent content validation by three domain experts (two academic professors in the real estate field and one practitioner in the industry). The pilot test conducted on the Lagos mainland population of 10 firms produced a Cronbach's Alpha coefficient of 0.821, which is a high internal consistency. Physical administration and email distribution through follow-up were used in the collection of data, which lasted four weeks between January and February 2025.

3.4 Analytical Techniques

Data were analysed using IBM SPSS Statistics Version 27 following a systematic multi-stage analytical framework:

Step 1: Descriptive Statistics

Descriptive statistics (frequency counts, percentages, means, and standard deviations) were computed to profile respondents' socio-economic characteristics (as shown in Table 1).

Step 2: Factor Analysis

Factor analysis was employed to identify latent constructs underlying the perceived importance of sustainability features. The suitability of the dataset for factor analysis was first confirmed using two diagnostic tests:

Kaiser–Meyer–Olkin (KMO) Measure of Sampling Adequacy

$$KMO = \frac{\sum_{i \neq j} r_{ij}^2}{\sum_{i \neq j} r_{ij}^2 + \sum_{i \neq j} p_{ij}^2} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots Eqn\ (1)$$

Where:

$r_{ij} = represents\ the\ simple\ correlation\ between\ variables\ i\ and\ j, and\ p_{ij}$ $represents\ their\ partial\ correlation$

A KMO value ≥ 0.60 (Kaiser, 1974) indicates sampling adequacy for factor analysis.

Bartlett's Test of Sphericity

$$X^2 = \left[n - 1 - \frac{2p+5}{6}\right] \ln | R | \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots Eqn\ (2)$$

Where:
n = sample size,
p = number of variables, and
|R| = determinant of the correlation matrix.

A significant ($p < 0.05$) value suggests that the correlation is not an identity matrix, and factor analysis is suitable.

Factors were extracted with the help of Principal Component Analysis (PCA), and only those with an Eigenvalue of more than 1.0 were kept (Kaiser Criterion). The extracted factors were varimax rotated to get orthogonal interpretation structures. Loadings greater than 0.40 were considered significant only (Hair et al., 2019).

Step 3: Independent Samples t-Test

An Independent Samples t-test was used to test the assumption that there is a statistically significant difference in the meantime on market between commercial properties with and without sustainability features. The t-test version developed by Welch was used because they could not presuppose homogeneity of the variance. The value of the test is presented as:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (Eqn\ 3)$$

Where:

$\bar{X}_1, \bar{X}_2 = group\ means\ (TOM\ for\ sustainable\ and\ non - sustainable\ properties),$

$s_1^2, s_2^2 = group\ variances,$

$n_1, n_2 = group\ sample\ sizes.$

The degrees of freedom (df) for Welch's correction were computed as:

$$df = \frac{\left(\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}\right)^2}{\frac{\left(\frac{s_1^2}{n_1}\right)^2}{n_1 - 1} + \frac{\left(\frac{s_2^2}{n_2}\right)^2}{n_2 - 1}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..Eqn\ (4)$$

The level of significance was 2-tailed and was set to alpha (α) = 0.05. If $p<0.05$, the null hypothesis (H_0: $\mu_1 = \mu_2$) will be rejected, which means that there is a significant difference in the mean TOM between the two property groups.

3.5 Ethical Considerations

The respondents' participation was voluntary, and informed consent was obtained before the data were collected. Anonymity and confidentiality was granted for the respondents, and no personally identifiable data was collected. Therefore, the methodological procedure presented the empirical basis of the results of the factor extraction (Tables 2-4) and the results of the inferential t-test (Tables 5-6) in the following section.

4. Results and Discussion

4.1 Respondents Background

The analysis of the socio-economic background of respondents working in registered estate surveying and valuation firms was conducted to verify their suitability to give adequate information to achieve the goal of this study. Their background information (academic qualification, professional qualification, year of experience and scope of service) was examined using frequency distribution. The results are presented in Table 1.

Table 1: Respondents' Background

Respondents Background	Category	Frequency (f)	Percentage (%)
1. Academic Qualification	Higher National Diploma	85	56.6
	B.Sc / B.Tech	61	40.7
	M.Sc / M.Tech	4	2.7
	Total	**150**	**100**
2. Professional Qualification	MNIVS	128	85.5
	FNIVS	22	14.5
	Total	**150**	**100**
3. Years of Experience	1–5 Years	19	13.1

	6–10 Years	28	19.3
	11–15 Years	38	26.2
	16–20 Years	48	33.1
	Above 20 Years	17	11.7
	Total	**150**	**100**
4. Scope of Services Rendered	Valuation	12	8.3
	Property Management	47	32.4
	Agency	32	22.1
	Facilities Management	52	35.9
	Property Development	7	4.8
	Total	**150**	**100**

Source: 2025 Field Survey

Table 1 encapsulates key characteristics of the valuers in the various real estate firms. The data reveal that the majority of the respondents (56.6%) held Higher National Diplomas (HND), followed closely by Bachelor's degree holders (40.7%), indicating a moderately high level of academic exposure in the real estate profession. Only a few respondents held postgraduate degrees (M.Sc/M.Tech (2.7%), which shows that the respondents are academically inclined to do justice to the aim of the research. In terms of professional qualifications, most respondents (85.5%) were Members of the Nigerian Institution of Estate Surveyors and Valuers (MNIVS), while 14.5% were Fellows (FNIVS), suggesting a strong presence of professionally certified personnel and a smaller cohort of senior, long-standing professionals. Experience-wise, the majority of practitioners (33.1%) had been in practice for 16–20 years, followed by 26.2% with 11–15 years of experience. This indicates a predominantly experienced respondent base, which enhances the reliability of their perspectives on sustainability and rental market dynamics. Only 13.1% of respondents were early-career professionals (1–5 years), highlighting that insights were drawn mainly from mature professionals. On the scope of services, Facilities Management (35.9%) and Property Management (32.4%) were the most commonly rendered services among respondents. This is consistent with the study's thematic focus on commercial rental property markets, where such services are essential. Other areas like Valuation (8.3%) and Property Development (4.8%) were less represented, implying a more operational than developmental orientation among respondents. The socio-economic profile demonstrates a diverse yet experienced population of practitioners, well-positioned to assess the impact of sustainability features on time-on-market for commercial properties. Their academic and professional background, coupled with service scope and years of experience, lend credibility to the findings derived from the study.

4.2 Factor Analysis of Sustainability Features Affecting Time-on-Market in Lagos Commercial Properties

The underlying dimensions of sustainability features influencing the time-on-market of commercial rentals in Lagos were identified using factor analysis. Interrelated variables in the analysis were reduced to core elements that reflect estate surveyors' sustainability priorities and their role in leasing performance.

Table 2: KMO and Bartlett's Test of Sphericity

Measure	Value
Kaiser-Meyer-Olkin (KMO) Measure	0.814
Bartlett's Test of Sphericity (Chi-Square)	1784.612
Degree of freedom (Df)	153
Sig. (p-value)	0.000

Source: 2025 Field Survey

Table 2 shows that the KMO with a value of 0.814 is above the 0.60 that is accepted to be sufficient (Kaiser, 1974), which means that the sampling adequacy is meritorious to perform a factor analysis. The significance of the Bartlett Test is very high ($p < 0.001$), which means that the correlation matrix is not an identity one and factor analysis is suitable in this dataset.

Table 3: Total Variance Explained

Component	Initial Eigenvalue	% of Variance	Cumulative %
1	5.456	30.31	30.31
2	2.948	16.38	46.69
3	2.074	11.52	58.21
4	1.347	7.48	65.69

Source: 2025 Field Survey

From Table 3, four components with Eigenvalues more than 1 were obtained, and the components explain 65.69% of the total variance, leaving a good result when analysing social science research (Hair et al., 2019). This indicates a significant underlying pattern in the importance ratings of the sustainability features.

Table 4: Rotated Component Matrix of Sustainability Features Affecting Time-on-Market in Lagos

Features	Factor 1 (Energy & Water Efficiency)	Factor 2 (Indoor Environmental Quality)	Factor 3 (Materials & Waste Management)	Factor 4 (Accessibility & Amenities)
LED Lighting	0.768			
Low-flow fixtures	0.712			
Solar Panel	0.751			
Lower energy mechanical	0.692			
Ventilation system (efficient)	0.630	0.414		

Rainwater harvesting	0.675				
Grey water system	0.668				
Indoor air quality		0.782			
Low-VOC Paint		0.748			
Motion sensor	0.684				
Sustainable materials			0.771		
Waste re-use and control			0.742		
Garbage and recycling bins			0.709		
Sustainable landscaping	0.533	0.446	0.412		
Carbon offsetting			0.501		
Energy management	0.641		0.452		
Green roof	0.511				
Elevators with accessibility				0.794	

Extraction Method: Principal Component Analysis
Rotation Method: Varimax with Kaiser Normalisation
Loadings ≥ 0.40 shown
Source: 2025 Field Survey

Table 4 shows the factor analysis conducted on the importance ratings of the sustainability features in the management of commercial properties in Lagos Island. The table revealed four components. These components describe the views of the estate surveying and valuation firms on the sustainability priorities existing in the properties that are under their care. ***Energy and Water Efficiency***, with a total variance of 30.31%, was the first component. This aspect included applications such as LEDs, solar energy systems, reduced energy mechanical systems, and motion

sensors, as well as water conservation appliances and rainwater collection systems. The predominance of these characteristics indicates that property managers focus on the improvement of costs of operation, energy performance and water economy within the framework of the high-density urban market in Lagos Island. This outcome is consistent with international experience. According to Younos and Parece (2016), energy and water efficiency remain the most popular aspects of sustainable property management practices in resource-scarce urban environments.

The second component, which explained 16.38% of the variance, was named ***Indoor Environmental Quality***. High loading of indoor air quality management and use of low VOC paints, as well as effective ventilation systems, defined this construct. This factor is indicative of the increasing focus on human-based performance measures when it comes to managing the property of a commercial entity, as tenant health, comfort, and wellness have all become central in becoming a conscientious property man. The same trends are observed in other city markets, as enhancing indoor environmental quality becomes an increasingly desired objective thanks to its ability to significantly increase the productivity of employees and the satisfaction levels of tenants (Nurick and Thatcher, 2021).

Materials and Waste Management was the third component, and 11.52% of the overall variance. It integrated the use of sustainable materials, waste re-use and control plans, recycling, separation of garbage systems, and the use of sustainable landscaping. Its make-up shows that its management is oriented towards the reduction of environmental footprints by maximising efficiency in the use of materials and adherence to responsible waste disposal strategies. This aligns with the principles of the circular economy, built around the practice of reusing resources without any waste and waste minimisation in construction (Ghisellini *et al.,* 2016). This factor confirms the growing level of operationalisation of waste management practice in commercial real estate, yet its comparatively less significant to variance prompts that serves as a less important aspect compared to energy and indoor quality issues.

The fourth factor explained 7.48% of the variance, which was labelled ***Accessibility and Amenities***. Remarkably, this variable was characterised by features related to accessibility, such as audio announcements, wheelchair access, accessible control panels, and visual display systems. Its loading identifies a specific awareness of social sustainability and inclusivity obligations in commercial property delivery. Although this factor accounts for the least percentage of variance amongst the four, its existence cannot be ignored, as there appears to be a gradual shift towards the inclusion of inclusive design and accessibility features regarding global green building certification frameworks like LEED and BREEAM (Maqbool *et al.,* 2023).

These findings, in general, indicate a multifaceted outlook towards sustainability among the estate surveying and valuation firms handling commercial development on the Lagos Island. The fact that operational efficiency is focused on the aspects of energy and water consumption highlights cost management and energy resilience as drivers of the local property market. In this respect, accessibility, as a feature of social inclusion, is becoming better understood but is less prioritised compared to other legislations. This pattern in sustainability priorities can be explained by the evolving application of green building practice in emerging urban economies, where its adoption usually starts with the operational sustainability, then social sustainability and, in the end material sustainability (Chong and Low, 2013; Nielsen *et al.,* 2016; Ghisellini *et al.,* 2016).

4.3 T-Test of Time-on-Market Differences by Sustainability Status in Lagos

To examine the time-on-market of commercial properties with and without sustainability in Lagos State, the respondents' estate surveying and valuation firms were asked the number of days these properties remained in the market before being let/leased, and the results are presented in Table 5.

Table 5: Group Statistics for Time-on-Market of Properties With and Without Sustainability Features

Group	Mean Days on Market	Standard Assumption
With Sustainability Features	74.16 days	Equal variance not assumed
Without Sustainability Features	81.80 days	

Source: 2025 Field Survey

Table 5 compares the average days properties spent on the market across the two groups. Properties with sustainability features averaged 74.16 days, while those without averaged 81.80 days, indicating a 7.64-day difference. Though the difference might appear modest, in commercial real estate, this gap can translate into significant financial and operational implications, especially when scaled across portfolios. Moreover, the standard assumption applied was that variances between the two groups are not equal (Welch's correction), which is appropriate given the different sample sizes and distribution shapes. The reduction in average market days for sustainable buildings supports the hypothesis that such features are commercially beneficial. This aligns with Eichholtz et al. (2010), suggesting that sustainable buildings enjoy better market liquidity due to tenant preferences for cost efficiency and corporate image alignment.

Table 6: Independent Sample T-test Result

Statistic	Value
t-statistic	-2.34
p-value	0.0197
Significance Level	0.05

Source: 2025 Field Survey

Table 6 reports the results of the inferential analysis using an independent samples t-test. The t-statistic of -2.34 indicates that the difference in means is sufficiently large relative to the variability within each group. The p-value of 0.0197 is below the 0.05 threshold, thus affirming that there is a statistically significant difference in the number of days properties spent on the market based on the presence of sustainability features. This result provides robust statistical evidence that properties with sustainable features are rented more quickly than those without.

Given that the test assumes unequal variances (Welch's t-test), the finding remains valid even with differences in group sizes and internal variability. The directionality (negative t-value) further confirms that sustainable buildings reduce rental duration.

Statistically, this means sustainability is not just a qualitative preference but a quantifiable performance factor that enhances marketability. This supports global research trends and provides context-specific validation within the Lagos commercial property sector. The implication for

investors and developers is that sustainable design and retrofitting could yield measurable advantages in occupancy efficiency and reduce holding costs.

5. Conclusion and Recommendations

This research has presented empirical data regarding how the sustainability characteristics can largely determine the time-on-market of business rental properties on Lagos Island, Nigeria. The investigation that used factor analysis and independent samples t-tests proved that buildings upgraded with sustainable characteristics are more marketable and efficient in terms of leasing. In particular, energy and water-saving, better indoor environmental quality, waste disposal, and increased accessibility in properties showed a statistically significant decrease in the marketing time in terms of conventional properties ($p = 0.0197$). The results confirm that sustainability is not only a controlling or moral requirement but is a measurable performance distinguishing characteristic with direct connotations to the liquidity of markets and returns on investments. The four dimensions of sustainability that were evaluated, energy and water efficiency, were the most influential, as they depict the environmental and economic concerns of a congested city such as Lagos. The features of indoor environmental quality and accessibility also proved to become increasingly more relevant, and this indicates a change of inclusivity and user-centered design in the commercial property market.

Practically, the study shows that sustainability provides quantifiable competitive advantages in attracting tenants, minimising vacancy rates, and maximising operational efficiency. It is therefore advised that developers and investors should integrate the sustainability principles during the design and retrofit phases to ensure the assets perform as much as possible. They are essential to the practitioners of estate surveying and valuation to justify the implementation of sustainability metrics and green certification as the value-added aspect of the practice.

The research supports the need to put sustainability standards on urban development control and building regulations at the policy level. To ensure the adoption of green buildings, the Lagos State Government, in conjunction with professional associations such as the Nigerian Institution of Estate Surveyors and Valuers (NIESV), ought to provide incentive systems, including tax reductions, fast tracking of permission, certification discounts, among others. Hence, commercial property development sustainability is no longer a dream, but rather an evidenced determination of the market performance. Sustainability features of the Lagos commercial real estate market are sensitive to requirements that align with the global trends, which confirms that in Lagos sustainable buildings lease quicker, are smarter, and perform better.

Despite the empirical contribution of this study, it has a number of limitations. First, the sample was limited to commercial rental within Lagos Island, which is a prime and relatively mature submarket in Lagos State. This submarket has a different structural makeup, tenant profile and sustainability consciousness with emerging areas like Ikeja, Yaba and other mainland areas, and thus this restricts the external plausible applicability of the results on the other heterogeneous Nigerian urban markets. Second, the analysis was based primarily on the perceptions gathered from estate surveying and valuation companies, rather than on transaction or longitudinal lease data. As much as practitioner insights can offer useful market intelligence, responses based on perception are prone to reporting bias and informational asymmetry. Third, the cross-sectional nature prevents causal inferences, the relationship between sustainability features and the strategy of reduced time-on-market is observed and not necessarily proven. Lastly, the sustainability

attributes were operationalised using aggregate factor dimensions, and this might not be entirely able to reflect the granular performance differentials between certified and non-certified buildings. Future studies should combine transaction data, use a longitudinal or panel model and extend the geographies to other cities in Nigeria like Abuja, Port Harcourt and Ibadan. The inclusion of the behavioural data of tenants and formality of the green certification would also enhance the empirical soundness and policy relevance of sustainability-based market performance analysis in emerging real estate economies.

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